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5/1/89

REILLY INDUSTRIES, INC.

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April 24, 1989

EPA Region 5 Records Ctr.



393305

Ms. Angela Aye Tin
Manager, Technical Compliance Unit
Compliance Section
Illinois Environmental Protection Agency
Division of Land Pollution Control
2200 Churchill Road
P.O. Box 19276
Springfield, IL 62794-9276

RE: 1190400006 -- MADISON COUNTY
REILLY INDUSTRIES, INC.
ILD006278360
COMPLIANCE FILE

RECEIVED

APR 26 1989

IEPA-DLPC

Dear Ms. Tin:

Enclosed are two (2) copies of the 1988 annual report on the groundwater quality assessment program for the above-referenced facility. This report is being submitted in response to your compliance inquiry letter to me dated April 12, 1989. With submission of the enclosed report, I believe that Reilly Industries has corrected the apparent violation cited in your April 12 letter. The reason for the violation was a simple oversight on my part, for which I apologize.

I trust that this letter and the enclosed report constitute an acceptable reply to your April 12 compliance inquiry letter. Please let me know if this is not the case, and please feel free to call me (317-248-6426) if you have any questions or concerns regarding this matter.

Very truly yours,

REILLY INDUSTRIES, INC.

John C. Craun
Senior Engineer,
Corporate Environmental Affairs

JCC:lc

cc: (w/ enclosure):

M. A. Haney L. L. Pirtle
R. J. Kriner P. M. Rivers

ANNUAL REPORT, 1988

Reilly Industries, Inc.
Granite City, Illinois Facility
ILD 006278360

This annual report for calendar year 1988 is based upon the results of the Ground-Water Quality Assessment Program, and presented in accordance with 35 IAC, Part 725, Subpart F, Section 725.194(b)(2). In addition to presenting the rate of contaminant migration, this report discusses the effectiveness in achieving ground water cleanup levels using the ground-water gradient and source control well pumping systems. All field and laboratory data supporting this report have been previously presented in the regular quarterly reports submitted during 1988.

The effectiveness of the control well systems can be evaluated from both a hydraulic and a chemical viewpoint. Monthly water level measurements provide hydraulic data, which are used to determine the effectiveness of the pumping systems and the hydraulic influence these systems have upon the aquifer. In determining the pumping influence upon the aquifer, these hydraulic data are used to define areas of ground water recovery and calculate vectors of ground-water flow. Chemical data, which are obtained from water quality samples at selected wells once each quarter, are used to evaluate progress toward achieving cleanup standards. Both types of data are needed to demonstrate the effectiveness of the pumping systems.

Gradient Control System

Contoured water-level plots submitted in the quarterly reports have presented the configuration of the potentiometric surface in the upper portion of the American Bottoms aquifer. The contoured water levels indicate that the gradient control system effectively captures contaminated ground water along a line that extends from MW14 through MW19. The water level contour plots in the vertical dimension along the axis of ground water flow clearly demonstrate that the hydraulic influence of the gradient control system extends vertically to depths well below those at which contamination has been found. The vertically upward hydraulic gradient beneath the gradient control pumping system was an average factor of 4.9 greater than the horizontal (regional) hydraulic gradient at depth (below the influence of pumping) in the American Bottoms aquifer.

During 1988 water quality data indicated a reduction in volatile organic compound concentrations at key wells along the compliance point (MW10-1, MW10-2, MW14-2, MW14-3, MW19-

1, and MW19-2). Monitoring wells MW23 and MW24, installed during the latter part of the Fourth Quarter of 1987, continue to exceed cleanup standards but showed some reduction in volatile organic compound concentrations during 1988. The presence of solvent compounds in both these monitoring wells and in the wells of the gradient control system (especially TW10A) clearly demonstrates the effectiveness of the gradient control system for capturing contaminated ground water.

Source Control System

The source control pumping system is designed to recover contaminated ground water near the source area and prevent the migration of contaminants to the west. Contoured water-level data in the area of the source control pumping system show an elongated cone of depression that generally encircles all wells of the system. This cone of depression is separated from that caused by the gradient control system by a ground-water divide that exists along an approximate north-south trending line that extends through MW25, MW17, and MW16.

Contaminant concentrations at well cluster MW17 were reduced significantly during 1988. With the exception of benzene (12/88), all volatile and aromatic compounds were reduced to below cleanup standards. At MW16, only cis-1,2-dichloroethene exceeded cleanup standards during the quarterly sampling of April and July, but was reduced to levels below standards by October. These data indicate the effectiveness of the source control pumping system for controlling migrating contaminants from the source area.

The effectiveness of the source control system, like that of the gradient control system, exceeds original expectations in the vertical dimension. The vertically upward component of the hydraulic gradient at MW9 (located immediately east of the source control system) averaged a factor of 5.7 greater than the horizontal component of the hydraulic gradient at depth in the American Bottoms aquifer.

In spite of the fact that the water quality sampling point for the source control well system was inappropriately located (volatile compounds may have been lost during sampling) for much of 1988, composite samples of the discharge from the seven wells of the source control system indicate that the system is extracting a variety of volatile and aromatic organic compounds -- many of which exceed cleanup standards.

Rate of Contaminant Migration

As discussed in the preceding sections, contaminant migration from source areas is under the control of the source control pumping system. Contaminant migration in the area between the pumping systems is controlled by both of the systems due to the presence of the ground water divide. The hydraulic influences of the pumping systems make calculation of ground water flow rates very location-specific, especially in the area of the pumping wells. The average 1988 ground water flow rate between MW17-2 and MW10-2, where the average 1988 gradient was 0.0017, is calculated to be 0.75 feet per day or approximately 275 feet per year.

Conclusions

During 1988 the gradient control and source control well systems operated as designed. The systems influence the local hydraulics of the American Bottoms aquifer in such a manner that contaminated ground water in the source area is captured immediately downgradient of the source, a ground water divide is established in the area between the systems and the gradient control system has reduced concentrations to below cleanup standards along the western perimeter. Significant progress was made during 1988 toward achieving cleanup standards in the area west of the source control system. It will be some period of time before significant reductions in contaminant concentrations are seen at the source control system, but the system operates effectively to control ground water in the source area.

Based on the behavior of the pumping systems during 1988 there is no need to modify the Subpart F monitoring schedule beyond that presented in a January 5, 1989 letter from Mark Haney (ENSR) to Kenneth Liss (IEPA).